

Our Docket No: 42390P5593C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
Chia-Pin Chiu) Examiner: Not yet assigned
)
Application No: Not yet assigned) Art Unit: Not yet assigned
)
Filed: Concurrently Herewith)
)
For: Adhesive To Attach A Cooling)
Device To A Thermal Interface)
(As Amended))
)
A Rule 1.53(b) Continuation Application of) Examiner: Allen J. Flanigan
Serial No.: 09/158,227) Art Unit: 3743
Filed: September 22, 1998)
)

PRELIMINARY AMENDMENTS

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination of the present Rule 1.53(b) continuation application, please
enter the following amendments and consider the following remarks.

EXPRESS MAIL CERTIFICATE OF MAILING

Express Mail" mailing label number: EL 886507023 US

I hereby certify that I am causing the above-referenced correspondence to be deposited with the United States Postal Service "Express Mail Post Office to Addressee" service on the date indicated below and that this paper or fee has been addressed to the Assistant Commissioner for Patents, Washington, D. C. 20231

October 26, 2001

Date of Deposit

Krista Mathieson

Name of Person Mailing Correspondence

Krista Mathieson

Signature

October 26, 2001

Date

AMENDMENTS

In the Title:

Please replace the title with the following:

-- Adhesive To Attach A Cooling Device To A Thermal Interface --

In the Specification:

Please insert as the first sentence of the specification:

-- This application is a continuation patent application of Application Serial No. 09/158,227, entitled *Application of Pressure Sensitive Adhesive (PSA) to Pre-attach Thermal Interface Film/Tape to Cooling Device*, and filed on September 22, 1998. --

Please replace the paragraph beginning at page 9, line 24 with the paragraph:

Next, thermal interface 102, with PSA strips 104 applied near edges thereof, is attached to a surface 104 of base plate 120 as illustrated in **Figure 5**. The attachment is mainly due to an adhesive surface of PSA 104 that makes contact with surface 140 of base plate 120. Note that PSA 104 is compliable, becoming very thin when thermal interface 102 is pressed and attached to base plate 120 of heat sink 118. Heat may be transferred from the integrated circuit package 116 to the heat sink 118 mainly via heat transfer area 106, demarcated by dotted lines 112 and 114. Heat transfer area 106 is not covered by PSA 104. The vendor of the heat sink may then ship the assembly, including the heat sink 118 with the thermal interface 102 attached thereto, to the manufacturer of the integrated circuit package, for further assembling the integrated circuit package 116 to the assembly.

In the claims:

Please cancel claims 1-19 without prejudice. Please add claims 54-73 as follows.

54. (New) An apparatus comprising a thermal interface having a first side to attach to a cooling device by way of an adhesive attached thereon and a second side to receive heat from an integrated circuit by contacting the integrated circuit at a heat transfer area, wherein the adhesive is attached to areas of the first side that lie outside of the heat transfer area.
55. (New) The apparatus of claim 54, wherein the thermal interface comprises a film having a phase-change material to change from a solid phase to a liquid phase by receiving the heat from the integrated circuit.
56. (New) The apparatus of claim 54, wherein the adhesive is attached along a plurality of edges of the thermal interface.
57. (New) The apparatus of claim 54, wherein the plurality consists essentially of two.
58. (New) The apparatus of claim 54, wherein the plurality comprises four.
59. (New) The apparatus of claim 54, wherein the adhesive is attached around a periphery of the heat transfer area and substantially not attached within the heat transfer area.
60. (New) The apparatus of claim 54, wherein the adhesive has a thickness between about 0.125 millimeters and 0.25 millimeters.
61. (New) The apparatus of claim 54, further comprising the cooling device.

62. (New) The apparatus of claim 61, further comprising the integrated circuit attached to the thermal interface.
63. (New) A device comprising:
- a cooling device to receive heat generated by an integrated circuit;
 - a phase changing thermal interface film to thermally couple the cooling device with the integrated circuit, the phase changing thermal interface film comprising:
 - a heat transfer area between the integrated circuit and the cooling device,
 - a first surface to receive the heat generated by the integrated circuit by contacting the integrated circuit within the heat transfer area,
 - a phase change material to change from a solid phase to a liquid phase by absorbing the heat received from the integrated circuit at the first surface,
 - and
 - a second surface to provide the received heat to the cooling device by contacting the cooling device within the heat transfer area; and
 - an adhesive to attach the thermal interface to the cooling device, wherein the adhesive is attached to the thermal interface substantially outside the heat transfer area.
64. (New) The apparatus of claim 63, wherein the film comprises a Chomerics T443 film.
65. (New) The apparatus of claim 63, wherein the adhesive comprises a pressure sensitive adhesive.

66. (New) The apparatus of claim 63, wherein the adhesive has a thickness between about 0.125 millimeter and 0.25 millimeter.
67. (New) The apparatus of claim 63, wherein the adhesive attaches the thermal interface to the cooling device at a plurality of edges of the thermal interface.
68. (New) The apparatus of claim 67, wherein the plurality consists essentially of two.
69. (New) The apparatus of claim 63, wherein the adhesive is attached at a plurality of locations along a periphery of the thermal interface.
70. (New) The apparatus of claim 63, further comprising the integrated circuit attached to the thermal interface to generate the heat and to provide the generated heat to the thermal interface.
71. (New) An apparatus comprising:
 - a thermal interface comprising a heat transfer area having a first surface to receive heat from a device having a circuit and having a second surface to provide the heat;
 - a cooling device to receive the heat provided by the second surface of the thermal interface; and
 - adhesive means to attach the cooling device to the second surface of the cooling device without obstructing heat transfer through the heat transfer area.
72. (New) The apparatus of claim 71, further comprising the circuit device coupled with the first surface of the thermal interface.

73. (New) The apparatus of claim 72, wherein the cooling device is pre-attached to the thermal interface substantially before the circuit device is coupled with the thermal interface.

REMARKS

Applicant respectfully requests consideration of the present application as amended. Claims 1-19 are canceled without prejudice. New claims 54-73 have been added. The new claims are fully disclosed and supported in the original specification and no new matter has been added.

Title

Applicant has amended the title of the invention to more accurately reflect the invention as claimed in the present application.

Specification

Applicant submits herein proposed amendments to correct informalities. These amendments add no new matter.

Conclusion

Applicant submits that the presented claims are in condition for allowance and respectfully requests that the Examiner pass the claims to allowance. The Examiner is respectfully invited to contact Brent Vecchia at (303) 740-1980 if the Examiner finds any impediment to the prompt allowance of these claims that could be clarified with a telephone conference.

Charge our Deposit Account

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Date: October 26, 2001



Brent E. Vecchia
Reg. No. 48,011

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, California 90025-1026
(303) 740-1980

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Title:

The Title has been amended as follows,

[Application of Pressure Sensitive Adhesive (PSA) to Pre-Attach Thermal Interface Film/Tape To Cooling Device]

Adhesive To Attach A Cooling Device To A Thermal Interface

In the Specification:

The following has been added to the first sentence of the Specification:

This application is a continuation patent application of Application Serial No. 09/158,227, entitled *Application of Pressure Sensitive Adhesive (PSA) to Pre-attach Thermal Interface Film/Tape to Cooling Device*, and filed on September 22, 1998.

The paragraph beginning at page 9, line 24 has been amended as follows:

Next, thermal interface 102, with PSA strips 104 applied near edges [118] thereof, is attached to a surface 104 of base plate 120 as illustrated in **Figure 5**. The attachment is mainly due to an adhesive surface of PSA 104 that makes contact with surface 140 of base plate 120. Note that PSA 104 is compliable, becoming very thin when thermal interface 102 is pressed and attached to base plate 120 of heat sink 118. Heat may be transferred from the integrated circuit package 116 to the heat sink 118 mainly via heat transfer area 106, demarcated by dotted lines 112 and 114. Heat transfer area 106 is not covered by PSA 104. The vendor of the heat sink may then ship the assembly, including the heat sink 118 with the thermal interface 102 attached thereto, to the manufacturer of

Claims 1-19 are cancelled.

Docket No. 423905593C
Express Mail No. EL 886507023 US